

**CONDITIONS OF APPROVAL AND STANDARD OPERATING  
PROCEDURES FOR GEOTHERMAL DRILLING PERMIT TO DRILL  
GEOTHERMAL WELL**

**Lease Number:** N-42707  
**Well Numbers:** #53A-21 (OW-15)  
**Location:** T29N, R23E, Section 21  
USGS Quads: San Emidio Desert South, NV 7.5 min.  
  
**Operator:** U.S. Geothermal Nevada LLC

**A COPY OF THESE CONDITIONS OF APPROVAL MUST BE FURNISHED TO YOUR  
FIELD REPRESENTATIVE TO ENSURE COMPLIANCE**

**Agency Contacts**

**BUREAU OF LAND MANAGEMENT**

Nevada State Office  
1340 Financial Blvd  
Reno, NV 89502-7147  
(775) 861-6400

Geothermal Program Lead: Lorenzo Trimble  
Cell: (775) 224-0267  
Office: (775) 861-6567  
ltrimble@blm.gov

Petroleum Engineer: John Menghini  
Cell: (775) 223-1359  
Office : (775) 861-6573  
jmenghin@blm.gov

Fluid Minerals Specialist: Dave Davis  
Cell: (808) 258-8721  
Office: (775) 861-6575  
drdavis@blm.gov

Black Rock Field Office  
Authorized Officer: William Mack  
Black Rock Field Manager  
Cell: (775) 455-5940  
Office: (775) 623-1578  
wmack@blm.

**NEVADA DIVISION OF MINERALS**

Nevada Division of Minerals  
400 W. King Street # 106  
Carson City, NV 89703  
(775) 684-7040

Oil, Gas and Geothermal Program Lead:  
Lowell Price  
Office Telephone: (775) 684-7045  
Cell: (775) 721-1744  
Fax: (775) 684-7052  
lprice@govmail.state.nv.us

Surface Management Inspection &  
Enforcement: Jim Weiser  
Office: (775) 623-1582  
Email: jweiser@blm.gov

**In case of an emergency and the Authorized Officer is not available, please contact:**

**Lorenzo Trimble, Geothermal Program Lead, BLM Nevada State Office – Office: (775) 861-6567  
or Cell: (775) 224-0267.**

## **I. PLEASE NOTE:**

All lease and/or unit operations will be conducted in such a manner that full compliance is made with applicable laws (Federal, State, and local), regulations (43 CFR parts 3200, 3260 and 3280), lease/agreement terms, **Geothermal Resource Orders, Stipulations, Lease Notice(s), Notice to Lessees (NTLs), the Approved Plan of Operation, Conditions of Approval** and this Geothermal Drilling Permit (GDP). Failure to comply with any and all of the above provisions will be considered a violation, subject to the enforcement provisions of 43 CFR Subpart 3277.

A complete copy of the approved GDP and these Conditions of Approval shall be maintained on location during all construction and drilling operations. Deviation from the approved plan **without prior approval is not allowed.**

The operator is fully responsible for the actions of his subcontractors. **It is, therefore, the responsibility of the Operator to ensure that subcontractors fully understand the necessity to comply with applicable laws, regulations, Conditions of Approval, etc. and the consequences associated with non-compliance.**

Approval of this application does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

This GDP shall be valid for two (2) years from the date of approval, provided the lease does not expire. If activities have not commenced by the end of the two (2) year period, the GDP may be returned to the operator without prejudice. Upon written request by the operator, a one-time extension to this time period may be granted by the Authorized Officer (AO). Should the operator still desire to drill the well, a new GDP may be required and submitted to this office.

## **Well Tests:**

If prior approval has not been granted for well testing, a Sundry Notice prior to commencing any testing must be submitted and approved.

**Well Completion:** The Operator must submit a Geothermal Well Completion Report, Form 3260-4 within 30 days after the well is completed. According to 43 CFR 3264.10, the Well Completion Report must include:

- a) A complete, chronological well history;
- b) A copy of all logs;
- c) Copies of all directional surveys; and
- d) Copies of all mechanical, flow, reservoir, and other test data.

## **II. Required Notifications:**

**Earthwork Notification:** the operator and contractor shall contact the BLM, Black Rock Field Office- (775) 623-1500, at least 48 hours prior to commencement of access and site construction or reclamation activities.

**Operational Notifications:** The operator shall contact the Geothermal Program Lead, Lorenzo Trimble (775-861-6567), and Jim Weiser, Geologist (775-623-1582), at least 24 hours prior to the following operations:

- SPUDDING ;
- RUNNING AND CEMENTING OF ALL CASING STRINGS;
- BOP(E) TESTS

Outside of business hours, authorizations may be obtained from the AO at the Field Office. Contact(s) is listed above.

## **III. Conditions of Approval**

**A. Drilling Plan**—The drilling plan of the GDP will be supplemented as follows:

1. If hydrogen sulfide is encountered the amounts must be reported to the BLM.
2. For air/aerated drilling operations, the following equipment shall be utilized: banjo box (or equivalent); a staked down blooie line directed to a blooie pit a minimum of 100 ft. downwind of the wellhead.
3. Daily drilling and completion progress reports shall be submitted to the Nevada State Office Petroleum Engineer (PE), Geothermal Programs Lead, and Fluid Minerals

Specialist on a daily basis, and shall include both daily mud reports and directional survey data.

## **B. Pressure Control**

1. The results of the BOPE test shall be reported to the Nevada State Office Petroleum Engineer.
2. All tests are required to be recorded on a calibrated test chart/graph and submitted to the Nevada State Office Petroleum Engineer.
3. The results of the BOPE test shall be reported to the AO.

## **C. Well Specifics**

1. This approval is contingent upon the lessee/operator being in receipt of and in compliance with all appropriate state and local permits.
2. The lessee/operator must abide by the Lease Terms, Lease Stipulations, Conditions of Approval, and all environmental protection measures and mitigation measures included in the GDP and Operations Plan.
3. When cultural or paleontological resources, including but not limited to historic ruins, prehistoric artifacts and fossils, are discovered in the performance of the permit, the resources shall be left intact and immediately brought to the attention of the BLM authorized officer. The operator shall suspend all activities in the vicinity of such discovery until notified to proceed by the authorized officer, and shall protect the site from damage or looting. The authorized officer will evaluate, or will have evaluated, such discoveries as soon as possible but not later than 5 working days after being notified. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the authorized officer after consulting with the operator. The operator is responsible for the cost of any investigation necessary for the evaluation and for any mitigation measures. The operator may not be required to suspend operations if activities can avoid further impacts to a discovered site or be continued elsewhere, however, the discovery shall be brought to the attention of the authorized officer as soon as possible and protected from damage or looting.
4. Pursuant to 43 CFR 10.4(g) the holder of this authorization must notify the Authorized Officer, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined at 43 CFR 10.20). Further, pursuant to 43 CFR 10.4(c) and (d), the lessee/operator shall immediately stop all activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the BLM Authorized Officer.

5. A careful examination of each area to be disturbed during the migratory bird breeding season (March 1 to Aug 31), shall be done to assure no nests with eggs or young are present. Surveys shall be conducted by a qualified biologist acceptable to the BLM Authorized Officer. If active nests are found, they shall be avoided by an appropriate distance to prevent destruction of the nest and disturbance of the nesting birds until they have fledged. Ground clearing activities outside of the breeding season are not subject to this condition of approval.
6. No hazardous material shall be used during any phase of the operations unless prior approval has been obtained from the BLM Authorized Officer. All onsite drilling materials and chemicals shall be properly stored to ensure the prevention of spills. No chromate or other heavy metals or environmentally harmful additives will be used.
7. No chemicals, fuels, oils, lubricants, or noxious fluids shall be disposed of at the drill sites, in the reserve or flow pits or down the wells.
8. If any chemicals, fuels, oils, lubricants, and/or noxious fluids are spilled during drilling operations, they shall be cleaned up immediately. The lessee/operator shall have absorbent on site for spill containment. After clean up, the chemicals, fuels, oils, lubricants and/or noxious fluids and any contaminated material shall be removed from the drill site and disposed of at an approved disposal facility.
9. The lessee/operator shall be responsible for all cost associated with any releases of chemicals and/or subsurface fluids resulting from their operations and practices.
10. Material Safety Data Sheets for all drilling mud components are to be provided to the Hazmat coordinator at the Winnemucca District Office.
11. A copy of the Contingency Plan for Spills and Releases must be maintained at the drill site during active operations.
12. The reserve pits (sumps) shall be fenced on three sides during drilling. Upon completion of the drilling operation, at each individual site, the fourth side should also be fenced until the liquid has evaporated out of the pit and the area has undergone reclamation. All fencing material would be removed from the area during or after reclamation activities. Wire fencing should be used to fence off the reserve pit/sump area. Use a minimum of four strands of wire, minimum 42 inches high. The top and bottom strands should be barbed. Durable flagging would be placed on all newly constructed fencing and replaced as needed.
13. Flagging shall be placed on all newly erected fencing to increase visibility to wildlife.
14. Portable chemical sanitary facilities shall be available and used by all personnel during periods of well drilling and/or flow testing, and construction. These facilities

shall be maintained by a local contractor.

15. All equipment and machinery shall be equipped with spark arresters and mufflers.
16. The lessee/operator shall be responsible for suppression costs for any fire resulting from their operations and practices.
17. Trash and other debris shall be contained onsite and then hauled to an approved landfill. Burial and/or burning onsite shall not be permitted.
18. The lessee/operator shall be responsible for controlling all noxious weeds and other undesirable invading plant species in the disturbed operating and reclaimed area until the revegetation activities have been determined to be successful and accepted by the BLM Authorized Officer. The lessee/operator shall obtain approval from the BLM Authorized Officer for any application of herbicide, and the request must include descriptions of the types and quantities. Seed tests of individual species must be submitted prior and approved by the BLM Authorized Officer unless certified weed free seed is procured for the reclamation of this project. All seed (each individual species) shall be tested for purity, noxious, poisonous and or prohibited plant species, and the test results submitted to and approved by the BLM Authorized Officer.
19. Once the wells are successfully completed, the drill pad shall be reduced in size to only that necessary for observation operations.
20. If a completed well will be sitting idle for longer than one year, the site shall be scarified and seeded with the BLM recommended seed mix.
21. Upon abandonment of the geothermal wells, the following shall be done:
  - a. The wells shall be plugged to comply with all Federal and State of Nevada regulations.
  - b. All reclamation of disturbed areas shall be completed within one year from the date of proper plugging and abandonment of the well. Any constructed roads, drill pads and reserve pits shall be recontoured to original grade, salvaged topsoil spread on the disturbed area and the site scarified. The BLM Black Rock Field Office shall be notified in writing when reclamation operations are completed.
  - c. Seeding of disturbed areas will be completed using the native seed mixture found in item 22 below. Any variance in the mix shall be coordinated with the BLM Black Rock Field Office.
22. Unutilized disturbed areas shall be seeded by the applicant as directed by the BLM Winnemucca District Office using the following native seed mixture and application rate. Any variance in the mix shall be coordinated first with the BLM Winnemucca

District Office.

**BLM Recommended Seed Mix:**

Species	PLS* lbs/Acre	Bulk lbs/Acre	PLS*/sq. ft	Variety
Black greasewood	3	10	18	VNS*
Shadscale	3	5	4	VNS*
Bottlebrush squirreltail	1	1.5	4	VNS*
Inland saltgrass	3	3	25	VNS*
Totals	10	19.5	51	

VNS\* = Variety Not Specified    PLS\* = Pure Live Seeds

23. The habitat could support a number of migratory birds as well as Western burrowing owls (*Athena cunicularia hypugaea*). Any proposed exploration construction activities from **March 1 through August 31** at the proposed well site would be preceded by appropriate bird surveys. Surveys would be performed using BLM protocols and conducted by a qualified biologist approved by the BLM. Survey results would be forwarded to and approved by the BLM biologist prior to any disturbance activities. Should active nests be located, disturbance activities would cease until the nests are inactive or appropriate mitigation measures (i.e. buffer zones, delays, etc.) can be established.
24. The same routes used to access well sites should be used throughout the monitoring phase. From **March 1 through August 31** and anytime breeding migratory birds will be disturbed by motorized vehicles, wells would be travelled to on foot.
25. All available topsoil shall be salvaged during construction and stock-piled for use during subsequent reclamation of the disturbed areas.
26. All disturbances will be reclaimed according to BLM performance standards and requirements. Reclamation will be completed at the earliest feasible time, and the operator shall reclaim the area disturbed by taking reasonable measures to prevent or control on-site and off-site damage of the Federal Lands. This includes; measures to control erosion, landslides, and water runoff; measures to isolate, remove, or control toxic materials; Reshaping the area disturbed, application of the topsoil, and re-vegetation of disturbed areas, including scarifying and reseeding overland travel disturbance; and notifying the authorized officer when reclamation has completed so that an inspection of the area can be made.
27. Any areas containing cultural resources shall be avoided or the potential for impacts mitigated in a manner acceptable to the BLM Archaeologist. NGP employees, contractors, and suppliers shall be reminded that all cultural resources are protected

and if uncovered shall be left in place and reported to the NGP representative and/or their supervisor.

28. Before using a “tremie line”, contact the BLM and explain how you are going to use it on the surface casing.

29. Reclamation of the reserve pit/sumps will commence when the observation wells are no longer used for monitoring purposes and/or further development is not anticipated.

**Additional Mitigation Measures:**

- **Migratory Birds:** In order to avoid potential impacts to breeding migratory birds, a nest survey shall be conducted by a qualified biologist within potential breeding habitat prior to any surface disturbance proposed during the avian breeding season (March 1st through August 31st). Surveys must be conducted no more than 10 days and no less than 3 days prior to initiation of disturbance. Surveys must follow established BLM standards and protocols, and should be approved by the BLM biologist prior to being implemented. If active nests are located, the BLM biologist must be notified immediately and appropriate protection measures which may include avoidance or restriction of activities will be established. If no active nests are present in the area surveyed, implementation of the project should commence within 10 days of survey completion. (Migratory Bird Treaty Act) (DOI-BLM-NV-W010-2012-005-EA)
- **Special Status Plants:** A special status plant survey was conducted July 2014 and no special status plants were found within the project area. However, there is still the potential of special status plants within the project area. If a special status plant is located, the BLM must be notified immediately and appropriate mitigation will be established. Appropriate mitigation may include avoidance, seed collection of the target species, or transplanting of target species. The special status plant survey must follow the BLM plant survey protocols and survey results must be sent to the BLM biologist. (BLM Manual 6840-1) (NV-IM 2011-059)
- **Reclamation:** Reseed well pads and areas of overland travel after use using recommended seed mixture (see attached COAs), to get vegetation regrowth in the well pads and areas of overland travel. If a special status species is located within the 250 foot buffer zone around the disturbance areas, reclamation may also include reseeding the areas with the collected seed from the special status plant species. (NV-IM 2011-059)
- **Wildlife Mortality – General:** The operator will notify the Bureau of Land Management (BLM) authorized officer and nearest Fish and Wildlife Service (FWS) Law Enforcement office (916-414-6660) within 24 hours, if the operator discovers a dead or injured federally protected species (i.e., migratory bird species, bald or golden eagle, or species listed by the FWS as threatened or endangered) in or adjacent to a pit, trench tank, exhaust stack or fence. (If the operator is unable to contact the FWS Law Enforcement office, the operator must contact the nearest FWS Ecological Services office (775-861-6300).) (WO-IM-2013-033 P Fluid Minerals Operations)



- **Exclosure Fencing (Fluid Pits and Open Cellars):** The operator will design, construct and maintain exclosure fencing for all open cellars and pits containing freestanding fluids to prevent access to livestock and large forms of wildlife such as deer, elk, and pronghorn. At a minimum, the operator will adequately fence all fluids pits and open cellars during and after drilling operations until the pit is free of fluids and the operator initiates backfilling. The operator will maintain the fence in order to protect public health and safety, wildlife, and livestock. (For examples of exclosure fencing design, refer to the Oil and Gas Gold Book – Exclosure Fence Illustrations, Figure 1, Page 18.) Adequate fencing includes all of the following:
  - Construction materials will consist of steel and/or wood posts. Use a fence with a minimum of four separate strands of wires, minimum 42 inches high. The top and bottom strands should be barbed. Use connectors such as fence staples, quick-connect clips, hog rings, hose clamps, twisted wire, etc. Do not use electric fences.
  - Set posts firmly in the ground. Stretch the wire, if used, tightly and space it evenly, from the ground level to the top wire, effectively keeping out animals. Construct the fence at least 2 feet from the edge of the pit.
  - For reserve pits, fence all four sides as soon as the pit is constructed. Reconstruct any damage to the rig side of the fence immediately following release of the drilling rig.
  - Maintain the erect fences in adequate condition until the pit has been closed. (WO-IM-2013-033, Fluid Minerals Operations)
- **Escape Ramps (Open Pits and Cellars, Tanks, and Trenches):** The operator will construct and maintain pits, cellars, open-top tanks, and trenches, that are not otherwise fenced, screened, or netted, to exclude livestock, wildlife, and humans (for example, lined, clean water pits; well cellars; or utility trenches) to prevent livestock, wildlife, and humans from becoming entrapped (one side of the reserve pit walls will be sloped at a 30% incline). At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in pits, cellars, open-top tanks, or at frequent intervals along trenches where entrapment hazards may exist. (WO-IM-2013-033, Fluid Minerals Operations)
- **Exclosure Netting (Open-top Tanks):** Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock (WO-IM-2013-033, Fluid Minerals Operations).

